

AMENDMENTS TO THE DRAWINGS

The attached sheets include changes to Figures 1 and 3. These sheets, which include Figures 1 and 3, replace the original sheets including Figures 1 and 3. Figure 1 has been labeled as "Prior Art" and in Figure 3, reference number 20' has been indicated.

Attachment: Replacement Sheet(s)

REMARKS/ARGUMENTS

The Examiner is requested to approve the accompanying replacement drawings. Figure 1 has been labeled "Prior Art" and in Figure 3, reference numeral "20" has been changed to correctly refer to--20'--.

The amendments set out above and the following remarks are believed responsive to the points raised by the Office Action dated April 15, 2005. Reconsideration is respectfully requested.

Claims 2 and 6 have been canceled, and claims 1, 3-5, and 7-10 remain pending. Claims 1, 5, and 7-10 have been amended to describe the invention more clearly. Claim 3 has been amended to change the dependency. No new matter has been added, the basis for the amended claim language may be found within the original specification, claims, and drawings.

The drawings were objected to because Figure 3 included an incorrect reference numeral and Figure 1 was not designated as "Prior Art". The accompanying replacement drawings include the changes suggested by the Office Action, and therefore it is respectfully submitted that the objection has now been overcome.

Claims 1 and 4-6 were rejected under 35 U.S.C. §102 as anticipated by U.S. Patent Publication No. 2003/021776 to Kulmann et al. (hereinafter referred to as "Kulmann"). Claims 2-3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kulmann. Claims 1 and 5-6 were further rejected under 35 U.S.C. §102 as anticipated by DE 197 45 802 (hereinafter referred to as "DE '802"). Claims 7-10 were rejected under 35 U.S.C. §103(a) as obvious over DE '802. Each of these rejections is respectfully and separately traversed.

Amended independent claim 1 is directed to a slide spool valve including a valve body having a bore penetrated by a plurality of ports spaced at predetermined intervals, including a supply port, two load ports located on opposite sides of the supply port, and two exhaust ports located on opposite sides of the load ports. The valve body also includes tapered valve chambers located at each end of the bore which are penetrated by a respective exhaust port and which have a smallest diameter which is larger than a diameter of the bore and an outer end diameter which is larger than the smallest diameter. The slide spool valve further includes an insert, including a hollow portion inserted in and attached to the bore and a valve chamber which extends from an inner circumferential surface of the hollow portion to the supply port and is connected to the supply port, and a valve spool which is movably inserted in the bore and the hollow portion of the insert, and selectively connects and disconnects the plurality of ports according to operation of the slide spool valve. A slide spool valve having a supply port that is always connected to the valve chamber of the insert and tapered valve chambers that are penetrated by the exhaust ports provide a compact valve that can be easily manufactured.

None of the cited references discloses or even suggests the present invention as defined by amended claim 1. For example, although Kulmann discloses a pneumatic gate valve including valve bushings, Kulmann does not disclose a valve including an insert having a hollow portion and a valve chamber extending from an inner circumferential surface of the hollow portion to the supply port and which is connected to the supply port. The valve bushings 3a, 3b, 3c, and 3d, of Kulmann do not include a valve chamber extending from the inner circumferential surface of the hollow portion to the supply port and none of the bushings of Kulmann are connected to any of the ports. Thus, the valve of Kulmann has a more complicated structure and is more difficult to manufacture than the valve of the present invention. Kulmann also fails to disclose a valve body including tapered valve chambers at each end of the bore having a smallest diameter which is larger than the bore diameter and which are penetrated by exhaust ports.

According to the Office Action, it would have been obvious to one of ordinary skill in the art to provide a taper on the outer chambers of Kulmann to facilitate molding since Applicant asserts no criticality in this feature. Applicant respectfully disagrees.

The Examiner has provided no support for the assertion that it would have been obvious to provide a taper and has not identified any basis for the assertion that a tapered valve chamber facilitates molding. None of the cited references discloses or suggests the advantages of locating tapered valve chambers at each end of a bore, let alone utilizing tapered valve chambers having a smallest diameter which is larger than the bore diameter. Rather, it is Applicant's disclosure that teaches utilizing tapered valve chambers at each end of a bore and the associated advantages. For example, the present specification teaches that the tapered valve chambers make it easy to detach the valve body from the mold after molding (see e.g., page 4, lines 18-20) and provide optimum conditions to reduce the number of valve members of a valve spool (see e.g., page 4, lines 20-21). Additionally, the tapered valve chambers make it easy to insert bushings into the tapered chambers, when it is desired to provide additional radial support to the valve.

For the above reasons, Kulmann cannot anticipate or suggest the presently claimed invention and thus, amended claim 1 and those claims depending therefrom are patentable over Kulmann.

The valve disclosed in DE '802 (as described in paragraph [005] of Kulmann and seen in the figures of DE '802), does not include an insert having a hollow portion and a valve chamber which extends from an inner circumferential surface of the hollow portion to a supply port and is connected to the supply port. Indeed, the description of DE '802 in Kulmann, on which it appears the rejection is entirely based, merely discloses that the valve includes individual pre-fabricated valve bushings. There is no disclosure of an insert including a valve chamber connected to a supply port or of tapered valve chambers located at each end of a bore. The Figures in DE '802 also fail to show an insert including a valve chamber or a valve chamber

connected to a supply port or tapered valve chambers located at each end of the bore. Accordingly, DE '802 cannot anticipate or suggest the presently claimed invention and thus, amended independent claim 1 and those claims depending therefrom are patentable over DE '802.

Furthermore, dependent claims 7-10 are also patentable over DE '802, not only because they depend from patentable independent claim 1, but because they include limitations not taught by DE '802.

According to the Office Action, it would have been obvious to one of ordinary skill in the art to form the metallic inserts of DE '802 of die cast aluminum having an anodized surface. Applicant respectfully disagrees.


In some embodiments of the present invention, the insert includes a film (claims 7 and 9) and in some embodiments the insert may comprise die cast aluminum and the film may comprise an anodized surface of the die cast aluminum. The specification and the claims make clear that an insert comprising die cast aluminum and a film comprising the anodized surface of the aluminum advantageously reinforces coupling of the insert to the valve body. Nothing in DE '802 suggests utilizing die cast aluminum inserts or utilizing an insert including a film, let alone utilizing die cast aluminum inserts having a film comprising the anodized surface of the aluminum to reinforce coupling between the valve body and the insert. The description of DE '802 (as described in Kulmann) merely states that the valve bushings are made of metallic material and does not even mention including a film for reinforcing coupling between the bushing and the valve body. Accordingly, DE '802 cannot suggest the slide spool valve claimed in claims 7-10, and for this additional reason, these claims are patentable over the cited reference.

For the reasons set forth above, reconsideration of the rejections is respectfully requested.

In view of the amendment and remarks recited herein, the application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue.

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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Amendment or ROA - Regular (Revised 5-19-05)